Space Weather Forecast

Issued on Monday, 20 November 2023 at 13:25 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Increasing Chance of R1 minor radio blackouts. Risk of G1 minor geomagnetic storms, peaking Tuesday 21 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was moderate, with a single M-class flare at 20/0903 UTC, emanating from the large region in the northeast of the visible disk. There are currently six sunspot groups on the disc, all of which are in the eastern solar hemisphere. Three of these are unnumbered and have recently rotated onto the visible disk or have emerged. One notable complex spot resides in the southeast, with another, larger, aforementioned spot in the northeast. both continue to grow and complexify.

Numerous filament and prominence eruptions were apparent on coronagraph imagery in the period, although the vast majority appeared far-sided or else emanated from the limbs, with none expected to be Earth directed.

Solar Wind / Geomagnetic Activity: Solar winds, have followed a varying slow regime in the past 24 hours, with hints of a very weak transient late in the period. The solar wind speed fell slightly from 360m/s to around 310 Km/s. The interplanetary magnetic field rose later in the period, peaking at moderate levels at 20/1003 UTC, though the north-south component remained weak, with an erratic character. The net result of the above solar wind measures was for Quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a daily chance of Moderate-class X-ray flares from current eastern solar horizon sunspot regions, perhaps rising slightly as a result of a further arrival over the eastern solar horizon.

Solar Wind / Geomagnetic Activity: There is one coronal mass ejection in the current forecast - the central filament eruption from 16/0100UTC. Solar wind parameters indicate an imminent arrival, bringing a Slight Chance of a G1/Minor Geomagnetic Storm today (20 Nov). Activity is expected to otherwise be mostly Quiet to Unsettled until the anticipated onset of a coronal hole high speed stream on Tuesday or Wednesday (21/22 Nov), which may see a slightly greater Chance of generating a G1/Minor Geomagnetic Storm should it arrive on Tuesday.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	30	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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